DOCUMENT RESUME

ED 097 875 IR 001 236

AUTHOR	Raben, Charles S.; And Others
TITLE	Social Reinforcement: A Review of the Literature.
INSTITUTION	Air Force Human Resources Lab., Brooks AFB, Texas.
REPORT NO	AFHRL-TR-74-9(1)
PUB DATE	Aug 74
NOTE	63p.
EDRS PRICE	MF-$0.75 HC-$3.15 PLUS POSTAGE
DESCRIPTORS	Incentive Systems; *Learning Theories; *Literature Reviews; *Motivation; Reinforcement; Reinforcers; *Social Psychology; *Social Reinforcement; Sociology; Training

ABSTRACT

Major studies and theoretical positions within the incentive motivation field are reviewed in order to present an integrated picture of past and present research. Special emphasis is placed on delineating social reinforcement variables in an attempt to explicate their relative importance within the context of social reinforcement theory; however, little emphasis is placed on strategies which have investigated different combinations of these variables. The review concludes with a summary of social reinforcement concepts and research. (Author)

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AFHRL-TR-74-9(I)

AIR FORCE HUMAN RESOURCES LABORATORY

SOCIAL REINFORCEMENT:
A REVIEW OF THE LITERATURE

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August 1974
Interim Report for Period June 1972 – September 1973

Approved for public release; distribution unlimited.

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This interim report was submitted by the Department of Psychology, Ohio State University, Columbus, Ohio 43215, under contract F41609-72-C-0044, project 1121, with Technical Training Division, Air Force Human Resources Laboratory (AFSC), Lowry Air Force Base, Colorado 80230. Dr. James R. Burkett, Technical Training Division, was the contract monitor.

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REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: AFHRL-TR-74-9 (I)	2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): SOCIAL REINFORCEMENT: A REVIEW OF THE LITERATURE	5. TYPE OF REPORT & PERIOD COVERED: Jun 72 - Sep 73 Interim
6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s): Charles S. Raben, Milton D. Hakel, Michael T. Wood, Richard J. Klimoski	8. CONTRACT OR GRANT NUMBER(s): F 41609-72-C-0044
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Department of Psychology, Ohio State University, Columbus, Ohio 43215	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: PE 62703F, 11210406
11. CONTROLLING OFFICE NAME AND ADDRESS: HQ Air Force Human Resources Laboratory (AFSC), Brooks Air Force Base, Texas 78235	12. REPORT DATE: August 1974
	13. NUMBER OF PAGES: 64
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): Technical Training Division, Air Force Human Resources Laboratory, Lowry Air Force Base, Colorado 80230	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Social reinforcement
contingency management,
incentive management
incentives
social incentives
reinforcement
motivation
training

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This review summarizes major studies and theoretical positions within the incentive\motivation field in order to present an integrated picture of past and present research. Special emphasis is placed on delineating social reinforcement variables in an attempt to explicate their relative importance within the context of social reinforcement theory; however, little emphasis is placed on strategies which have investigated different combinations of these variables. The review concludes with a summary of social reinforcement concepts and research.

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INTRODUCTION

Incentive systems have experienced an increasing popularity within recent years. Programs designed upon principles of reinforcement have attempted to motivate a wide range of behaviors in a variety of social settings. The common feature shared by each of these various programs is the goal of enhancing performance or productivity. It is with respect to this goal and its actualization that social reinforcement represents a unique effort to combine reinforcement concepts and otherwise naturally occurring phenomenon. The reinforcing value of social behavior itself is presumed integral to its subsequent modification.

The empirical investigation of social reinforcement variables has been thorough yet unsystematic. This report represents an effort to organize and review this research in establishing a macroscopic perspective of its current status. The focus of contemporary research has been upon the efficacy of social reinforcement as a motivational tool. This concern has taken the form of examining process and situational variables that moderate its effectiveness. The organizational scheme to be employed in discussing the existing body of research has been established upon specific classes of these variables. Since the scheme is intended to summarize the status of conceptual components and not the particular strategies or combination of factors which have been adopted by researchers, a study may be mentioned a number of times in the contexts to which it is relevant.

The first section of the report is devoted to the nature of social incentives. The emphasis is upon the variety and comparison of reinforcers which have been empirically examined. This initial review will enable us to derive at least an operational definition of what has come to be known as "social" reinforcement.

The next two sections will review research which has examined various characteristics of the subject and reinforcing agent as moderating variables upon social reinforcer effectiveness. Although some attempt will be made to discuss these areas of research separately, they should be considered as interdependent determinants of reinforcement effects. There are instances in which the characteristics of interest are established by the interaction of both participating agents. For example, the effects of sex or race of the reinforcing agent must, to some extent, be considered in conjunction with the subject's sex or race.

The fourth section discusses the range of behaviors which have been studied relative to the use of social reinforcers. In this

category are those studies which have assessed the strength of social reinforcement by examining its ability to modify the particular forms of behavior under investigation. Also included is research distinguished by its particular setting and to which the behavior studied is unique.

A final review section examines research which can be considered under the general rubric of process dynamics. While the greatest variety of research is included here, all share in common the study of dynamics crucial to the social reinforcement process. The report concludes with a summary of the status of social reinforcement concepts and research.

An annotated bibliography on social reinforcement is presented in AFHRL-TR-74-9(II).

SOCIAL INCENTIVES

An analysis of social reinforcement research requires a consideration of the particular reinforcers, or incentives, that have been adopted. Generally speaking, the overwhelming majority of studies have simply investigated some form of verbal praise. While some research has examined the dynamic and motivational properties of verbal praise (e.g., informational and approval functions) and will be reviewed in later sections of this paper, this preliminary section will include essentially two forms of research: (1) research which has examined the ability of relatively novel social reinforcers to modify behavior, and (2) research which has compared the effects of social versus nonsocial reinforcers upon behavior. It will become surprisingly clear that available research has not offered a consistent nor consensual definition of what constitutes social reinforcement.

Variety of Social Incentives

Reitz and McDougall (1969) have examined the use of interest items from the Strong Vocational Interest Blank as potential reinforcers. Results indicated that significant performance gains on a visual discrimination task were due to interest items which were used as reinforcers, and which had been previously endorsed as high in desirability. The authors concluded that interest items do affect performance in a manner similar to traditional reinforcers when they are made appropriately contingent upon a response.

Kennedy, Timmons and Nobbin (1971) investigated the differential reinforcing effects of psychoanalytic type interpretations, reflections

of a nondirective nature, and mild affirmatory statements in raising the level of a selected response class during acquisition. Significant conditioning occurred with each of the three types of verbal reinforcers. Psychoanalytic type interpretations, however, were slightly less effective (not significantly less effective) than the other two reinforcers. It was suggested that interpretive statements may constitute a class of noxious stimuli and, therefore, function as a mild punishment. In another study employing three similar reinforcers; i.e., approval, reflection, and interpretation, DiJames (1970) found that the application of those verbal reinforcers could also be used to significantly affect verbalizations connoting anxiety.

A study conducted by Leventhal and Fischer (1970) has questioned the basis of influence in typical social reinforcement settings. They have examined the possibility that changes in performance are a function of subtle cues in the experimenter's behavior and not due to the operation of administering rewards. Findings indicated that increases in rate of responding did occur in the reinforcement conditions but before reinforcement was initiated. Changes in performance were attributable to changes in the subject's emotional state created by the experimenter's presence. Similar findings due to the presence of the experimenter are reported by Meddock, Parsons and Hill (1971). Thus, the mere physical presence of another in a potentially evaluative setting may simply constitute another form of "social" reinforcement.

An intriguing study by Turner, Foa and Foa (1971) has recently examined the relationships of six classes of interpersonal reinforcers (love, status, information, money, goods and services) relative to their position on two conceptual dimensions: particularism and concreteness. Particularism refers to the extent to which the value of the reinforcer is influenced by the individual who administers it. Concreteness refers to a concrete-symbolic dimension along which reinforcers are distinguished by the form or type of their expression. Data supported the order of the reinforcers indicated above by demonstrating the following: a) reinforcers proximal in the order are perceived as similar and are more often substituted for one another than distal ones, b) in exchange situations, certain reinforcers are only traded for other particular reinforcers (there is an inverse relationship between the probability of choosing a reinforcer for exchange and its distance from the most preferred one), and c) the intercorrelation of reinforcers does not vary across exchange situations. These findings suggest that preferences among reinforcers are relatively stable, and that an established order among reinforcers can be a useful tool in choosing and/or substituting available incentives in applied settings.

Other research efforts have shown that performance can be significantly modified with a variety of other "social" reinforcers. These include: photographs of liked and disliked persons (Lott & Lott, 1969); attitudinal agreement (Kaplan & Olczak, 1970, 1971); massive verbal

reinforcement (Clark & Walberg, 1968); time off from work (Howell, 1971); increased responsibility (General Electric Personnel Research Bulletin, 1971), and nonverbal communication (Delahanty, 1970).

Effects of Social and Nonsocial Incentives

The second major body of research concerning incentives to be presently discussed includes those studies which have compared the differential effects of social and nonsocial reinforcers upon behavior. Other distinctions often made between these two classes of reinforcers are simply nonverbal versus verbal or tangible versus intangible. Such distinctions imply a tentative definition of social reinforcement. Yet the variety of actual reinforcers subsumed under each reference indicates a more comprehensive interpretation than that suggested by "verbal" or "intangible" alone.

Barnhart (1968) has proposed that an individual learns to orient himself selectively toward a stimulus which provides informative cues in guiding his behavior regardless of whether those stimuli are social or nonsocial in nature. This implies an informational function to reinforcement, which will be more fully discussed later with regard to process dynamics.

The effects of verbal-positive, non-verbal positive, verbal-negative, and non-verbal negative reinforcement upon the responses of lower and middle class children to a discrimination task have been examined by D'Ambrosio (1969). Verbal-negative reinforcement produced the greatest number of correct responses for both socioeconomic groups. No significant differences were found between the groups that received verbal and non-verbal positive reinforcement.

Four other studies have also studied the reinforcing properties of social and non-social incentives within the context of socioeconomic group differences. Spence and Dunton (1967) found that the performance of subjects (mean age = 4.9 years) given candy as a reward was inferior to the performance of other subjects given either punishment or a reward-punishment combination regardless of socioeconomic status.

Examining the effects of tangible (tokens cashed for toys) and intangible (right/wrong feedback) rewards upon the conceptual thinking of fourth grade lower class boys, Cernius (1968) found no significant differences between the types of rewards on concept attainment, concept switching, or in decision accuracy. Highly anxious subjects, however, were found to have performed poorer on some of the tasks.

Contrary to these findings, Hollander (1968) found that candy rewards increased the performance speed of fifth and sixth graders

while verbal praise increased performance accuracy. It was also found that older children responded better to praise than younger ones.

A study by Hassett (1970) examined the effects of money, candy, personal praise and praise in the task performance of several lower class cultural groups (Anglo, Navaho, Spanish-American and Black). A unanimous response to material rewards observed among the groups was attributed to lower class membership and not to the cultural differences.

Other research examining the differential effects of social and nonsocial incentives further suggests a simultaneous consideration of individual characteristics and/or the behavior under investigation. Witryol, Lowden, Fagan and Bergen (1968) examined the effects of reinforcement schedule (100% verbal versus 100% material; 100% verbal versus 50% material), motivation-inducing instructions, age and sex upon a two-choice discrimination learning, problem-solving task, in which one choice was rewarded with a verbalism and the other with a small toy. Results indicated that choice of verbal reward increased as a function of instructions, schedule, and age. Subjects who were low in socioeconomic status chose more verbal than material rewards. Subjects considered high in socioeconomic status were not responsive to the schedule conditions while middle class subjects were most influenced by the instructions.

Differences in persistence at a task due to monetary and social incentives have been examined by Williams (1970). Findings demonstrated that social reinforcement was more effective than monetary reinforcement in increasing persistence. No differential effects due to socioeconomic level were found. Females, however, demonstrated greater persistence than males.

A recent study by Bergan, McManis & Melchert (1971) has investigated the effects of token (later traded for money) and social reinforcement on WISC (Weschler Intelligence Scale for Children) performance. Boys were found to be more accurate in the token reinforcement condition than in the verbal or control conditions. Girls, on the other hand, were more accurate when they received social reinforcement. Considering speed of performance, boys were the fastest when they received social reinforcement while girls were equally fast in both reinforcement conditions.

Brown (1971) found that a combination of tangible and social reinforcement was more effective in modifying behavior than either form of reinforcement alone. It was concluded that altering social and tangible incentives apparently altered the meaning of the tangible reinforcer to include approval.

Deci (1972) found that verbal reinforcement was more effective in increasing intrinsic motivation than was monetary reinforcement. This finding, however, was restricted to male subjects.

Finally, two studies have examined the relationship of vicarious reinforcement (i.e., modeling) to both social and nonsocial incentives. In comparing the responsiveness of three rehabilitation clients to verbal, vicarious and monetary reinforcers, Bowersock (1970) reports a failure in one subject to condition to any reinforcer, good conditioning in response to vicarious reinforcement in the second subject, and substantial conditioning in response to both verbal and monetary reinforcement in the final subject. Finch (1970) compared the effects of direct and vicarious delivery of social and monetary reinforcers on imitative responses. Significantly, more imitative responses were found among those subjects in the direct monetary reinforcement group than in the vicarious monetary reinforcement group. Members of the direct social reinforcement group also demonstrated more imitative responses than those in the vicarious social reinforcement group. Furthermore, vicarious social reinforcement produced more imitative responses than vicarious monetary reinforcement.

It is evident from the preceding review that the ability of social reinforcers, at least when compared to nonsocial reinforcers, to significantly modify behavior is fairly well established. Qualitative distinctions as to the relative superiority of social or nonsocial reinforcers, however, remains equivocal. Situational constraints (e.g., subject characteristics, operant behavior) apparently prohibit any conclusive interpretation of unilateral effectiveness. Situational variables that moderate the effectiveness of social reinforcers, on the other hand, will be considered in other sections of this paper.

It is also apparent from the research considered here that while the majority of studies have interpreted social reinforcement to mean verbal praise (this is in reference to the remaining studies included in this paper), different interpretations have been offered. We have seen that the mere physical presence of another individual as well as interest items that allegedly have social connotations have qualified as social reinforcers. For empirical purposes, therefore, it appears that any reinforcer which denotes or even connotes the intervention and/or association of other individuals has qualified as a social reinforcer. From a theoretical point of view and with regard to the tangible-intangible dimension, however, the issue is still unresolved. For instance, does the receipt of a certificate granting an individual time off from work constitute a social or nonsocial reinforcer? Theoretically, it may be argued that when the time off is spent with family or in some other social context, it does indeed qualify as a social incentive. Yet because a certificate is being awarded (not much different perhaps than money when considered as barter) it may qualify as a nonsocial incentive according to the tangible-intangible criterion.

Thus, research and theory to date have not offered a meaningful definition of social reinforcement. While a complete definition at this point would be premature, our preliminary conceptualization dictates a social/non-social distinction on the basis of the reinforcement process rather than discriminative stimulus characteristics of an incentive. In very general form, let us say that a reinforcer qualifies as social if its psychological reward value is altered by variations in other individuals or groups. This value dependency may be reflected in two elements of the reinforcement process, administration and consummation. Reward value may be determined by the context of the reinforcing agent and/or the subject's reference group for the consummation of the reinforcement. Diagrammatically, we have, for example:

Administering Agent			Consumed with or Esteemed by
A leader A colleague A friend Oneself	⟶	Reward (Praise, money, recognition...)	⟶ Oneself Another(s) A referent other A friend Family
.			.
.			.
.			.

Variations in the "socialness" of the reward could occur in either the antecedent or consequent relationships.

Determination of the social nature of reinforcement implies analysis of the recipient's cognitions. Social reinforcement operates to fulfill the social acceptance, affiliative, interpersonal gratification motives of people. Verbal praise, by this argument, may or may not be social reinforcement; an alternate possibility would involve ego-enhancement. Similarly, "time off from duties" may or may not be social reinforcement (alternate interpretation: effort-avoidance). Thus most common reinforcers could be viewed as social to some degree. An example of an extreme or "pure" social reinforcement in this framework would be an invitation by a friend to attend a party with anyone of the subject's choosing. An extreme nonsocial reinforcer (for a human) might be a candy bar delivered by a machine and to be eaten alone. Obviously, commonly studied reinforcers will vary between such extremes. By definition of "social" as involving associations between people, social reinforcement will vary with the qualitative nature of those associations.

CHARACTERISTICS OF THE SUBJECT

A wide range of subject characteristics have been examined for purposes of determining their moderating influence upon social reinforcer effectiveness. Evidence concerning these moderating effects comes from both theoretical and applied research efforts. Some studies have focused upon general class distinctions between people, while others have examined specific individual differences.

Clinical Abnormality

Krueger (1970) examined the effects of peer and adult reinforcement on the behavior of delinquent adolescents in group therapy. Peer reinforcement, when compared to other treatment conditions, produced a higher rate of verbalization in the predefined response categories, more resistance to extinction, the greatest amount of generalization to other behaviors outside of therapy, and enabled subjects to delay immediate primary reinforcement for later secondary reinforcement. Delinquents receiving adult reinforcement showed their greatest gains in the verbal response categories. Not only were operant techniques effective with delinquent adolescents, but Krueger's research demonstrates the enhancing effect of using peers as reinforcing agents.

In comparing delinquent with otherwise "normal" high-school age boys, Reagor (1970) found no differences between the groups in response to three different types of social reinforcers (praise, attitude agreement, and correctness feedback) in a quasi-interview verbal conditioning task. Hypotheses that normal subjects would respond better to social reinforcement than would delinquents and that there would be an interaction between subjects and type of reinforcer were not supported.

When Peel (1970) compared the effect of social reinforcement on primary and secondary psychopaths and normal subjects, he also found no significant differences among the groups. The pairing of social reinforcers with tangible rewards and punishments (gain and loss of cigarettes or money), however, increased the effectiveness of social reinforcers for secondary psychopaths, decreased their effectiveness for high anxious normals, and had no effect on the other groups.

Further evidence is available concerning the effectiveness of social reinforcement with other "deviant" populations. Sternlight, Bialer and Deutsch (1970) have studied the role or praise, censure, and aspirations on the motor performance of institutionalized retardates. Their data suggest that censure alone surpassed censure plus aspirations in the facilitation of learning. The effects of praise alone and praise plus stated aspirations were not significantly different from control group

responses. A study conducted by Moss and Houts examined the effects of the social atmosphere of psychiatric wards upon general patient satisfaction, reaction to the ward and self-perceived initiative among the patients. Although not actually a study of operant techniques, a positive relationship was found between patient satisfaction and perceived support and affiliation on the ward.

Numerous other subject populations have been examined in their responsiveness to social reinforcement. Warner (1971) has recently studied the effects of model-reinforcement and verbal-reinforcement group counseling on the overt behavior of alienated students. Students in the model-reinforcement and verbal-reinforcement counseling groups demonstrated more appropriate behaviors as indicated by teacher ratings than either those in a placebo counseling group or those who received no group counseling.

The relationship of response style to the effectiveness of verbal and nonverbal reinforcers and reward/punishment combinations have been studied by Hemry (1969). Data from first grade males performing a discrimination learning task indicated that reflective subjects produced the fewest errors. Overall performance was poorest in the reward ("right" or candy) and better in the punishment ("wrong" or buzzer) and reward/punishment conditions.

Parental Associations

Subject characteristics arising from various parental associations have been investigated by three studies as potential moderating influences on social reinforcer effectiveness. Phillips (1966) reports a study in which he examined the responsiveness of father-present and father-absent southern Negro boys. Results indicated, as predicted, that subjects responded more to Negro than white adult reinforcing agents, and that father-absent subjects were more responsive than father-present subjects. The expectation that father-absent boys would be more responsive to white than Negro reinforcing agents due to a lack of identification with the Negro male sex role was also supported. Predicted responsiveness to sex of Negro reinforcing agent among father-absent boys was not supported. Phillips speculates that this finding may be due to the high degree of authoritarianism associated with both sex roles in lower class Negro cultures.

A study conducted by Ward, Day and Hamlin (1969) examined the effects of perceived similarity to parents upon responsiveness to social reinforcement. Contrary to expectation, a negative relationship was demonstrated. Subjects low in perceived similarity to parents were more responsive to social reinforcement than those high in perceived similarity. Heilbrun (1970) has presented data which indicates that

responsiveness to social reinforcement is also related to perceived maternal child-rearing experience.

Socioeconomic Status

Another area of research has focused upon biographic and demographic characteristics. Numerous studies have successfully demonstrated differential effects in reinforcer effectiveness attributable to levels of socioeconomic class. Davison (1967) reports a study in which he examined the significance students attached to various teacher behaviors, which were intended to reinforce student behavior in the classroom. Upper socioeconomic class students attributed less significance to positive reinforcement than did students from the middle socioeconomic class. Lower class students attached an intermediate level of significance to positive reinforcement relative to both upper and middle classes. No differences were found in the significance that any of the classes attributed to negative reinforcement.

Fujitani (1969) found, in comparing the relative preference of reinforcers among groups of different socioeconomic levels, that middle class children responded equally well when pennies and candy were used as reinforcers and demonstrated a stronger preference for pennies than for verbal praise. Lower class children preferred pennies to candy and yet preferred both to verbal reinforcement. Looking exclusively at responsiveness to tangible incentives, Olson, Bibelheimer, & Stevenson (1967) found that middle class children performed at a significantly higher level than lower class children. In a study conducted by Safer & Kornreich (1968) however, it was demonstrated that lower class children learn faster when given "concrete" candy reinforcers while middle class children learn faster with "abstract" light reinforcers. Similar findings are reported by Swingle and Coady (1969). After studying the differential responses of middle and lower class children of varying ages, they conclude that the middle class sensitivity to verbal incentives and lower class sensitivity to monetary incentives become more established as the child grows older.

Baker (1970) found that while there is usually a greater frequency of imitative responses among middle than lower class children, no differences were found between the groups when M & M candies were used as reinforcers. A comparison of reinforcement and no reinforcement groups demonstrated that both had actually increased their imitative responses. It was suggested that these findings may have been due to experimenter attention or perhaps some other form of social reinforcement operating in the experimental situation. When King (1970) studied the effects of social reinforcement on the motor performance of lower and middle class Negro pre-school children, he found no differential effects due to socioeconomic class. Tramontana (1971) also found no significant .

differences in the responsiveness of middle and lower class children to social and edible rewards.

Sex

The effects of sex upon the efficacy of social reinforcement have received much attention in the form of research. A good deal of this interest concerns the cross-sex effect attributed to the interaction of subject and reinforcing agent. The major discussion of research examining this effect will be reserved until later. One study however, does deserve to be mentioned in the present context. In the study by Davison (1967), cited earlier in this paper where students identified the reinforcing significance of various teacher behaviors, it was found that more significance was attached to positive reinforcement by boys than by girls. Yet there was no sex difference in the significance attached to negative reinforcement.

Age

Age has also been extensively studied as a moderating factor. Stabler (1967) compared the responses of 5-6, 9-10, and 14-15 year-old children to varying levels and schedules of reinforcement. Data indicated that older children had the highest proportion of correct responses. An interaction between age and schedule of reinforcement (50% vs. 80%) also occurred. Older children produced a greater proportion of correct responses at the higher percentage of reinforcement. Allen, Spear, and Lucke (1971) found that older subjects (2nd graders) increased response latency in a discrimination learning task when they received either praise or criticism following their responses, and demonstrated a lower response latency when they received no reinforcement. Younger subjects (1st graders), on the other hand, evidenced faster latency under praise and no reinforcement conditions than when they received criticism. Fujitani's study (1969) of relative preferences for verbal praise, pennies, and candy among groups of varying ages demonstrated significant differences between pre-school and second graders in their preference for the tangible reinforcers but not for verbal praise. This finding may be attributed to the use of a taped voice in the administration of praise which, as suggested, rapidly loses its reinforcing properties, and may not qualify as a social reinforcement.

Swingle and Coady (1969) found a significant age effect in which older children responded more rapidly than younger children to a lever pressing task. Their findings, including those mentioned earlier concerning the relationship of age to incentive preference among lower and middle class subjects, summarizes the importance of these factors (in combination) upon social reinforcer effectiveness.

Reinforcement concepts have also facilitated the modification of behavior among elderly adults. Leech and Witte (1971) have shown that the reinforcement of commission errors resulted in fewer errors of omission which had been previously noted as characteristic of older people in response to paired associate learning tasks.

Race

The examination of race as a moderating variable has, for the most part, been placed within the context of the subject's prior reinforcement history. Theoretically, the effects attributed to race arise from the subject's lack of exposure to, and reinforcement from, members of other races. Since prior reinforcement history and its relationship to the satiation of social reinforcers have been studied independently of race and will be discussed later with regard to process dynamics, only those studies examining race in particular will be reviewed here. Furthermore, it is fairly clear that the investigation of the subject's race (much like that of the subject's sex) presumes a simultaneous consideration of the reinforcing agent's race.

Heckenmueller, Schultz and Baron (1968) manipulated prior availability of social reinforcers by having a white reinforcing agent administer verbal praise to black and white subjects on a fixed interval non-contingent basis. This was followed by the test phase in which the reinforcing agent provided 100% contingent reinforcement for "correct" responses to an emotional labeling task. Although black and white subjects demonstrated equal base rate levels of the operant response, blacks showed a dramatic increase in its subsequent use significantly different from that of the white subjects.

In a later study Baron, Heckenmueller and Schultz (1971) once again found a significant main effect for race. Black subjects were more responsive than white subjects to a white examiner's verbal reinforcements despite variations in the presentation of the reinforcer during an initial interview task. Replicating this study with a black reinforcing agent Baron, Jackson and Fish (1972) found that prior availability of reinforcement exerted a stronger differential effect than race of subject. Low initial availability produced significantly more conditioning across race of subject than did high initial availability. Apparently, responsiveness to social reinforcement is not simply a function of prior availability or race of reinforcing agent. As Baron et al. suggest "...there is no single optimal pairing; whether a black or white examiner is likely to be more effective for black or white subjects is highly situationally determined; that is, is a joint function of availability of praise and race of reinforcing agent (1972, p. 127)."

Personality Characteristics

Numerous psychological and personality characteristics have also been studied relative to their impact on social reinforcement. Zdep (1969) studied the use of positive reinforcement on the verbal and performance behavior of subjects with given leadership orientations measured by the California Personality Inventory. Participation levels of subjects with low leadership scores were not altered by reinforcement. It was concluded that positive reinforcement could not alter established leadership patterns.

A study conducted by Leonard and Weitz (1971) examined the relationship of self-esteem to task enjoyment following success and failure. The expectation that self-esteem would moderate this relationship was not demonstrated. Task enjoyment was related to success for both groups.

Simpkins (1968) found no support for the hypothesis that socially immature subjects, in comparison to those considered socially mature, would perform poorly under conditions of verbal incentive, but markedly better when monetary incentives were offered. Similarly, Costello (1967) found no significant relationship between child's social competence and social reinforcer effectiveness.

A study by Sterner (1970) examined the effects of social rejection and social reinforcements on adolescents who differed in their level of peer social interest. It was expected that high social interest would interact with social rejection to produce an increased effectiveness of social reinforcers. Data indicated, however, that conditioning was enhanced among high social interest students when they received reinforcement in the absence of rejection. Furthermore, no differences in conditioning were observed among low social interest students when reinforcement followed either rejection or nonrejection.

Gouaux and Gouaux (1971) have recently examined the influence of induced affective states on the effectiveness of social and nonsocial reinforcers. A main effect for affective state was found. Elated subjects conditioned the fastest, then neutrals and finally depressed subjects conditioned the slowest. While social and nonsocial incentives had equal effects on elated subjects, depressed subjects responded slower to social than nonsocial reinforcers as indicated by a nonsignificant trend.

Evans (1969) has explored other possible relationships between responsiveness to positive social reinforcement and personality variables (psychological differentiation, emotional distance from reinforcing agent, and emotional arousal). Only one significant correlation was found which demonstrated an inverse relationship between responsiveness to social reinforcement and emotional arousal of the subject upon his initial contact with the experimenter. This finding was attributed

to the dual function hypothesis of social reinforcement which states that social reinforcement for children serves only to lower anxiety in highly anxious subjects, but yet strengthens performance in less anxious children.

Five studies have focused upon the moderating effects attributed to anxiety. Barton (1971) found no support for the hypothesis that the increased responsiveness of high verbal - low spatial skill subjects over high spatial skill - low verbal subjects to social reinforcement is due to aroused anxiety in the former group. A study by Lepper (1970) indicated a significant interaction between anxiety and experimenter valence in determining the effectiveness of social reinforcers. Anxious children more readily complied with a previously negative (i.e., experiences of failure and criticism) than a previously positive (i.e., experiences of success, praise) adult in a social reinforcement situation. Children who were not anxious however, more readily complied with the previously positive adult.

Hill and Dusek (1969) conducted a study in which they examined the effects of social reinforcement on the achievement expectations of subjects high and low in test anxiety. Their findings indicated that initial achievement expectations correlated negatively with test anxiety for girls, whereas change in achievement expectation correlated positively with test anxiety for boys in the social reinforcement condition. Silverman and Waite (1969) found no difference between high and low test anxious groups in responsiveness to social or nonsocial reinforcement. Flynn and Morgan also report no differential effects due to anxiety in the responsiveness of subjects to programmed or regular classroom methods of instruction.

Three research studies have directed their inquiry to the role of expectations in the social reinforcement process. Kaplan (1970) posits that it is the unexpected and unfamiliar aspect of the reinforcing agent which enhances the effectiveness of social reinforcement from peers. Results obtained by manipulating the expectation for reinforcement through a pre-training experience did suggest a differential response to subsequent reinforcement. Scoresby (1969) reports that when subjects in counseling received language consistent with their preference for expression or that confirmed their induced expectations, it did not significantly affect satisfaction with counseling, perceived interpersonal effectiveness, or the acquisition or learning of treatment terms and concepts. A study conducted by Ullrich (1969) however, found that client expectations about reinforcement and intervention from counselors did not affect their certainty or satisfaction with vocational choices after counseling.

Locus of control has constituted yet another variable of study within the present framework. Existing evidence offers only partial support, however, for its moderating effects upon social reinforcement.

Lawrence (1969) and Martens (1971) report that differences in locus of control did not mediate the effects of social reinforcement. A study conducted by Wachowiak (1970) also found that the internal/external dimension was not predictive of responsiveness to model-reinforcing counseling. It should be noted, however, that other data from the Wachowiak study indicated that self-confidence, extroversion, and masculine interests were predictive of counseling outcomes.

Examining the effects of both field dependence and locus of control upon effectiveness of external social reinforcement, Fitz (1970) found that field dependent subjects performed best under conditions of censure than either those of praise or control. Internally controlled subjects performed best in the control condition than either of the two treatment conditions (praise or censure). Furthermore, Fitz reports no correlation between field dependence and locus of control.

Looking exclusively at the effects of field dependence upon problem solving performance under conditions of praise, criticism or failure, Randolph (1971) reports that field dependent boys, when compared to field independent boys, performed more effectively when praised than when criticized. Whereas, any stress disrupted field dependent subjects, field independent subjects were less vulnerable to stress factors.

The locus of control variable has also been extended to an interpretation of the differences observed between races in responsiveness to social reinforcement. In a study by Tedeschi and Levy (1971), hypotheses concerning the effectiveness of social reinforcement were based upon the belief that lower class blacks possess an external control orientation and that middle class whites maintain an internal control orientation. Furthermore, since internally controlled subjects appear to perform better in skill task situations due to the control of their own rewards and externally controlled subjects perform better in chance situations, it was expected that blacks would be more responsive to social reinforcement in a skill situation while whites would be more responsive in a chance situation. Findings supported these hypotheses.

Other areas of research have identified additional personality variables that may moderate the effectiveness of social reinforcement. Berger (1968) has studied the effects of influence feedback and need influence as the relationship between incentive magnitude and attitude change. Data indicated no support for the predicted inverse relationship between incentive magnitude and attitude change among low need influence persons. When given success feedback concerning their attempts to influence others on personally discrepant beliefs, individuals high in need influence demonstrated greater self-persuasion than individuals low in need influence. It was proposed that, at least thecretically, the opportunity to influence others constitutes enough

justification among high need influence individuals to engage in belief-discrepant behavior.

Spector (1970) reported that while incentives had a significant effect upon role playing performance, no differential effects could be attributed to social motives. In studying the responsiveness of under- and overachievers to programmed and traditional methods of instruction, Flynn and Morgan (1966) found that underachievers performed as well regardless of instructional method. Achievers, however, benefited more from programmed instruction.

Social Deprivation

The satiation function of social reinforcement is, conceptually, a process dynamic and will be discussed in greater detail in a later section of this paper. Yet certain of its underlying theoretical elements can be construed as individual characteristics and, therefore, appropriately discussed in the present context. Social deprivation prior to the use of social reinforcement constitutes such a variable. Comparing the responses of high and low anxious children to social reinforcement after varying periods of social isolation, Kozma (1969) found a linear relationship between length of isolation and reinforcer effectiveness for low anxious subjects. High anxious subjects showed increased susceptibility to social reinforcement only after brief and prolonged periods of isolation. When subjects experienced visual stimulation during isolation, susceptibility to social reinforcement was delayed for both high and low anxious subjects. In a later study, Kozma (1971) posited that aroused anxiety during isolation is due to the anticipation of evaluation by a strange experimenter in a test-like situation. A positive evaluation should effectively reduce anxiety. Examining the role of anxiety-inducing instructions in contributing to the increased effectiveness of social reinforcement, Kozma observed that the instructions only led to increased effectiveness when combined with brief isolation periods. Anxiety reducing instructions, however, prevented the occurrence of the social isolation effect when administered prior to isolation. Kozma concluded support for the anxiety interpretation of the social isolation effect.

Miller and Hood (1970) have also examined the effects of social deprivation but found no evidence to support differential effects attributed to social isolation. They concluded, however, that the nature and duration of deprivation used in their study may have been inappropriate.

Endo (1968), in a test of social drive and arousal hypotheses concerning the increased effectiveness of social reinforcers, found support for the social drive interpretation with middle class subjects but neither of the hypotheses could adequately explain the responses of

lower class subjects. Richards (1970) has also examined the relationship of social deprivation and physiological arousal and has concluded that while isolation is associated with greater increases in arousal than nonisolation, the effect of isolation upon responsiveness to social reinforcers is questionable. Sterner's (1970) study, as reported earlier concerning the effects of social rejection and reinforcement upon adolescents of high and low peer social interest, produced data which were also interpreted as incompatible with the arousal or social drive hypotheses.

Hill and Stevenson (1970) have recently studied the effects of verbal, visual (colored slides) and social (presence of experimenter) reinforcement following three kinds of pretraining (isolation, film and satiation). He found that change in performance from baseline was higher following isolation than satiation in the verbal reinforcement condition for boys and in the social reinforcement condition for girls. Considering the visual reinforcement condition, change in performance for girls was highest following isolation, intermediate following the film, and lowest following the satiation experience. The opposite was true for boys.

CHARACTERISTICS OF THE REINFORCING AGENT

Research examining the moderating effects attributed to characteristics of the reinforcing agent has, to a great extent, paralleled the research covered in the previous section. Conceptually, both the subject and reinforcing agent represent entities whose characteristics must be considered equally and jointly as in any social psychological situation. The difference in the two bodies of research is that differential effects due to the reinforcing agent have received less attention than those due to the subject.

The impact of various types of reinforcing agents upon social reinforcer effectiveness has been examined. Moyer (1968) reports that leader verbal reinforcement did not affect understanding responses of student nurses to other group members or their references to and descriptions of the psychological state-of-being of patients. Clark (1969) demonstrated that the verbal reinforcements emitted by counselor supervisors significantly affected counselor trainees' verbal behavior. In a workshop intended to increase rates of reinforcement among educators, Kidd (1970) found that while the workshop did help to increase the use of reinforcement, rates of reinforcement were also a function of personality and anxiety variables.

Charlesworth and Hartup (1967) studied the reinforcement frequencies occurring in nursery school peer groups. Data indicated that children in the older groups reinforced one another at a significantly higher rate than those in the younger groups. It was also found that the amount of reinforcement given was positively related to the amount received. In a study examining the relationship between peer reinforcement and social status, Hartup, Glayer and Charlesworth (1967) found that social acceptance was significantly correlated with frequency of giving positive reinforcement but not with frequency of giving negative reinforcement. Rejection was significantly related to negative reinforcement and not to positive reinforcement. Children received more positive reinforcement from liked peers than from disliked peers, yet disliked and liked peers did not differ in the amount of negative reinforcement they emitted. In a later study Hartup and Coates (1967) examined a subject's general history of reinforcement from his peer group as a determinant of responsiveness to a rewarding peer model versus a non-rewarding model. Results indicated significantly more altruism among those subjects exposed to an altruistic peer model than those subjects not exposed to a model. Furthermore, subjects with a history of frequent reinforcements from their peers imitated a rewarding model significantly more than a non-rewarding model. Subjects with a history of infrequent reinforcement from peers, however, revealed the opposite response. They imitated non-rewarding peers significantly more than rewarding peers.

The effects of model competence on the behavior of subjects have been examined by Kanfer and Duerfeldt (1967). Total performance data indicated no significant differences among experimental groups as a function of the number of modeling experiences or model competence. Yet further analysis revealed the interesting finding that subjects who received modeling early during acquisition performed better than those who received modeling late in acquisition.

Kessel (1967) examined the effects of social reinforcement and the subject's conception of an interviewer's values relative to his own on the control of verbal behavior. Results indicated that subjects who were led to believe that their interviewer had values dissimilar to their own, rated their interviewer lower than those subjects who believed they shared similar values with their interviewer or control group subjects. Subjects talked longer on reinforced topics than on non-reinforced topics. Reinforcement was only effective with those subjects who reported awareness of the response/reinforcement contingency. Contrary to expectation, the dissimilar group was more responsive to reinforcement than the similar group (in analysis of awareness data only).

A study conducted by Griffitt and Guay (1969) tested the hypothesis that attraction toward others both responsible and not responsible for reinforcement would be a function of the proportion of positive

reinforcements received by the subject. Results supported this hypothesis. Furthermore, evaluative responses to non-human elements associated with the reinforcement were also a function of reinforcements received. Linford and Duthie (1970) found that the physical presence of the experimenter had become a conditioned reinforcer which prevented the extinction of a previous, intentionally reinforced response. Studies such as these suggest that responsiveness to a reinforcing agent as influenced by that agent's particular set of characteristics, thus, indirectly accounts for the form of the conditioned response generalized to other stimuli.

The visual and auditory characteristics of an experimenter have been studied by Jones (1968) in assessing the extent to which they influence the verbal conditioning rates of subjects. It was found that the conditioning rates of those reinforced for the use of "mildly hostile" verbs were significantly related to the physical size and voice intensity of the experimenter. The conditioning rates of those subjects reinforced for the use of "mildly friendly" verbs were unrelated to these experimenter characteristics.

As suggested in the previous section, the effects of the reinforcing agent's sex upon a subject's responsiveness to social reinforcement has been of particular interest to contemporary research. Silverman and Waite (1969) report an interaction between sex of experimenter and reinforcement condition. Male experimenters were more effective than female experimenters with subjects of both sexes under social reinforcement. No differential effects due to sex of experimenter were observed in the nonsocial reinforcement conditions.

Goldsmith (1969) found that the highest performance levels among black males and females occurred when the sex of the examiner was the same as that of the subject. Considering the three-way interaction of race of experimenter, race of subject and reinforcement condition, results indicated that males performed best with a black male experimenter under praise conditions and females performed best with a white female examiner also in the praise condition.

A study by Ransom (1969) investigated the hypothesis that the effects of social reinforcement coming from opposite-sex reinforcing agents (known as the cross-sex effect) would be greater than the effects coming from same-sex reinforcing agents at the mid-childhood and late adolescent levels and not at the early childhood level. In addition, it was also expected that social reinforcing statements from an older peer of the same sex would have a greater influence on learning than would statements from a same aged, same-sexed peer at the early - and mid-childhood levels. Besides the major finding that reinforcement did significantly affect learning, data provided only partial support to the principal hypotheses. The cross-sex effect was found at the mid-childhood and late adolescent levels as predicted, but only for girls.

The other predicted effects were upheld in only two of the four experimental groups.

Kaplan (1970) examined the effects of pretraining on the subsequent effectiveness of social reinforcement and predicted the cross-sex effect to occur in the no-pretraining condition. This prediction was not upheld, but the cross-sex effect was found after nonreinforcement pretraining. Paletz (1970) proposes that the cross-sex effect is, at least partially, a function of a child's prior reinforcement history; i.e., relative frequencies of reinforcement received from same-sex and opposite-sex adults. Examining this theoretical base, Paletz predicted that a subject's response frequency would be higher when a previously neutral experimenter was reinforcing or when a previously reinforcing experimenter was neutral than when the previously reinforcing experimenter was reinforcing or when a previously neutral experimenter was neutral. No support could be found for this hypothesis. Although a significant cross-sex effect was found for the pretraining games, a significant trend toward a same-sex effect was found over trials.

The examination of cross-sex and same-sex effects bears a striking resemblance to research examining the race variable. Since prior reinforcement history has been suggested as a possible theoretical base in each of these contexts, this coincidence should be further explored and investigated. A theoretical framework may exist in which the observed effects arising from variables such as sex and race can be systematically linked. Baron's work (1970) offers a promising effort to explain responsiveness to social approval in the context of situational considerations of reinforcement history and sex and race similarities of subjects and reinforcing agents.

INSTRUMENTAL BEHAVIORS

Other areas of research have examined, either directly or indirectly, the range of behaviors vulnerable to social reinforcement. In some instances, the actual form of behavior modified constitutes the major focus of the study. In other research, the behavior under investigation is only of secondary interest. Both kinds of research are of importance in assessing the parameters of social reinforcement.

Verbal Behavior

A number of research efforts have examined the ability of social reinforcement to modify various forms of verbal behavior. Ingling (1968) reports that, compared to other experimental conditions, only

those subjects obtaining a nickel as reinforcement demonstrated conditioning in a sentence construction task. A study conducted by Fielding (1968) revealed that social reinforcement, when administered on fixed interval and ratio interval schedules, was unable to significantly affect children's rate of verbalization. On the other hand, Block (1967) examined the ability of words rated as high on the evaluative, power, and activity dimensions of the semantic differential to alter the frequency of a verbal operant. His data confirmed the expectation that these forms of verbal reinforcement could alter the frequency of verbal operants.

Strauss (1970) reports a case study in which reinforcement was effectively used in controlling the talking behavior of a three-and-one-half-year-old girl. Strauss further reports that, when the experimenter removed the reinforcement, talking and other demonstrative behaviors such as playing, laughing, and yelling decreased. Mildly disruptive behaviors increased. Strauss concludes that the subject's display of disruptive behavior was an attempt to regain the experimenter's attention (previously under the control of her talking, playing, laughing, etc.).

A study conducted by Tosi, Upshaw, Lande, and Waldron (1971) examined the effects of social reinforcement, teacher expectations, and Premack procedures (i.e., if you do x, y will follow) upon voluntary class-related verbalizations emitted by subjects. Whereas, social reinforcement and teacher expectations significantly affected voluntary verbalizations, Premack did not differ from control conditions.

Social reinforcement has been of particular interest within the context of counseling relationships. Conger (1968) investigated client use of social reinforcement in influencing the therapist's verbal behavior. Client use of smiling, arguing, etc., did not significantly affect past and present verb forms (target response class) emitted by the therapist. Heterogeneity of variance due to sex differences among clients was believed to have obscured a main effect.

Lewis and Baker (1971) compared two model reinforcement counseling situations to assess the effects of reinforcing actual behaviors as opposed to statements of intent. No significant differences were found between subjects who had been exposed to a video tape of students reinforced for their statements or actual behaviors.

Lee (1968) reports that contingent social reinforcement was able to increase the confrontative and relationship statements of counselors from operant level to acquisition. The withdrawal of reinforcement, however, led to decreased response levels. Noncontingent reinforcement was also found effective yet had a greater impact on total response frequencies than on specific confrontative and relationship statements.

The differential effects of three verbal reinforcers ("mm-hm," "good," and "wonderful") on the verbal conditioning of affective self-references were examined by Hekmat and Lee (1970). The highest frequency of self-references occurred when individuals were reinforced with "wonderful." The lowest frequency occurred when "mm-hm" was used as the reinforcer. Furthermore, the strongest conditioning effects were produced by the verbal reinforcer rated positively highest on the Osgood semantic differential scales. Hekmat and Lee conclude that the classical conditioning of meaning may underly the established reward value of verbal reinforcers.

Wilder (1967), examining the effects of verbal modeling and verbal reinforcement on the frequency of self-referred affect (SRA) statements, found no significant differences between modeling and direct reinforcement yet a significant increase in SRA due to modeling when compared to the control condition. The inability of "mm-hm" to significantly affect SRA through operant reinforcement was primarily attributed to the relatively low number of reinforcements administered.

King (1968) investigated the ability of reflection when used as a verbal reinforcer to condition self-references. Data confirmed the expectation that both positive and negative self-references were amenable to conditioning. Other recent studies (Ferreira, 1969; Schilt, 1969; Dustin, 1971) have demonstrated social reinforcement to be effective in also increasing understanding and attending responses in either counseling or experimental settings.

Attitudes

Some research exists which indicates that attitudes can also be significantly influenced by social reinforcement. Insko and Melson (1969) studied the effects of verbal reinforcement of attitudes in both laboratory and nonlaboratory contexts. Data indicated a significant main effect upon attitudes due to reinforcement. No significant differences were found between verbal reinforcement administered in the laboratory or by telephone (nonlaboratory). Three types of awareness scores: awareness of the reinforcement contingency, awareness of what the experimenter wanted the subject to do, and intention to do what the experimenter wanted the subject to do were found to be positively correlated with the attitude score. Only a subset of the correlations were significant. Reinforcement did have a significant effect among unaware subjects.

Further examination of attitude reinforcement has been conducted by Prestholdt (1968). He posits that attitude behavior controlled only by the attitude object constitutes a "real" attitude. He further contends that control of attitude behavior is also possible through reinforcement or punishment administered by another person. This type of

control can take the form of conformity, compliance, or demand characteristics. Consequently, Prestholdt examined the effects of reinforcement (social approval) and punishment (social disapproval) upon attitude acquisition. Results indicated that the frequency of "correct" attitude statements increases with the use of social reinforcement and, furthermore, leads to the acquisition of a "real" attitude. Social punishment also increases the frequency of "correct" statements, but does not lead to the acquisition of a "real" attitude. Prestholdt concludes that social punishment produces compliant behavior under the control of the social punisher, but does not relate to "real" attitudes like that of approval.

Suinn, Jorgensen, Stewart, and McGuirk (1971) have recently proposed that fears, when conceived as attitudes, can also be changed through selective positive reinforcement. A test of this hypothesis indicated a significant increase in approach behavior toward the phobic object but no significant decrease in subjective level of fear. In this instance, reinforcement did not lead to the acquisition of a "real" attitude as previously demonstrated by Prestholdt but simply "compliant" behavior (a pattern previously attributed to punishment alone . Agras, Leitenberg, and Barlow (1968) were able to demonstrate that social reinforcement could effectively modify agoraphobia. It should be noted, however, that this conclusion is based on behavioral measures (which imply "compliant" behavior in the present context). No subjective measure of fear was gathered.

Birney (1970) has further investigated the dynamics of fear reduction. Discussion of high-anxious topics with verbal feedback was found to lead to increased anxiety among males and decreased anxiety among females. Confounding measurement within the experiment, however, causes one to question this finding.

Group Behavior

Various forms of group behaviors have been examined relative to social reinforcement techniques. Sarbin and Allen (1968) examined the ability of social reinforcement to alter the participation rates of high and low participators in a seminar. Low participators who received positive reinforcement increased participation during the first half of the reinforcement sessions and maintained that level in the remaining sessions. High participators who received negative reinforcement decreased participation sharply in the first half of the sessions yet increased to original operant levels during the remaining half. Data presented by Sorensen (1968) further support the conclusion that social reinforcement can successfully strengthen dominant behavior in a group setting.

The reinforcement of mutual recognition, interest, concern, and acceptance among group members was compared by Liberman (1970) to a more conventional group-centered counseling approach in assessing the utility of social reinforcement. Results demonstrated that patients in the experimental group showed significantly more cohesiveness and earlier symptomatic improvement than those in the comparison group.

Intragroup reinforcing behaviors have been investigated by Mudd (1968). Data presented indicate that the intensity of a group's disapproval of an offensive behavior varies in linear proportion to the degree of deviation of the behavior from the group norm and the importance of that norm to the group. Although not a direct test of reinforcer effectiveness, the findings of this study suggest that reinforcing mechanisms are used within groups to maintain conformity to their own norms.

Haslam (1970) conducted a study in which he examined changes in interpersonal behavior following selective reinforcement. Visual reinforcement was shown to increase leadership behavior and participation within the group. When not personally reinforced and yet exposed to the reinforcement of another subject, interaction-oriented subjects tended to lower their self-evaluation. Under the same circumstances, task-oriented subjects lowered the quality and quantity of their response. Self-oriented subjects lowered the quantity of their responses when not personally reinforced. This set of findings appears to concur with previous studies in confirming the ability of social reinforcement to modify group behaviors.

Classroom Behavior

Classroom behavior constitutes yet another important set of behaviors which have been examined in the social reinforcement paradigm. Hall, Panyan, Rabon, and Broden (1968) have presented case studies which demonstrate how beginning and inexperienced teachers were trained in the successful use of reinforcement principles to control classroom behaviors. Further evidence to support the effectiveness of reinforcers in the classroom is offered by Hapkiewicz (1972); Field, Simpkins, Browne, and Rich (1971); and a review by Altman and Linton (1971).

Some research has further qualified the use of social reinforcers in the classroom. A study by Buys (1970) found that although disruptive behavior decreased with the use of contingent social reinforcement, it rose again when reinforcement ceased. Herman and Tramontana (1971) have shown that individual and group reinforcement were not differentially effective in modifying classroom behavior. Furthermore, the addition of instructions to reinforcement strengthens the capacity to modify behavior.

Graubard (1968) has argued that contemporary teaching methods, which offer incentives based on individual performance, force an acceptance of societal norms. Furthermore, he contends that existing group norms could be utilized in effectively creating desired change. In the research examining this proposition, Graubard made rewards contingent upon group performance. Every group member had to perform effectively; e.g., learn, in order for anyone to receive a reward. Data confirmed the effectiveness of this method in altering classroom behavior.

Additional Behaviors

Besides the behaviors which have been identified thus far, research has also focused upon a variety of other behaviors either unique to the particular setting or simply so novel as to not have attracted much empirical investigation. This body of research indicates that social reinforcement can be used effectively to modify the following types of behaviors: social isolation and various forms of adaptive behavior (Milby, 1970; Sturm, 1969); interest selection (Wandzek, 1969); cigarette smoking (Tighe & Rogers, 1967; Guilford, 1972); health reporting (Marquis, 1970); Encopresis, i.e., soiling behavior (Conger, 1970); marital relations (Goldstein, 1971); information-seeking behavior in counseling (Samaan, 1970); and client perception of counselor effectiveness and achievement of counseling goals (Ryan, 1966). Other behaviors also successfully influenced by social reinforcement include: achievement motivation (Tang, 1970); altruistic behaviors (Carpenter & Carom, 1968); discrimination among children's names (Blain & Ramirez, 1968); responsiveness to hypnotic suggestion (Bullard, 1971); attendance (Nord, 1970; Carpenter & Carom, 1968); shifts in performance from quality to quantity (Adam, 1972); group problem solving (Cohen & Jaffee, 1970); response latency (Weinberg, 1968); leadership behavior (Eaglin, 1970); and basic combat training performance of Army recruits (Datel & Legters, 1970).

Available evidence from other research indicates that social reinforcement has been less successful in controlling: arithmetic achievement (Gosciewski, 1970); academic standing of underachievers (Gourley, 1970); career information seeking (Anderson, 1970); stealing behavior (Elliott, 1971); and dependent and competent behaviors (Speer, 1966). Evidence concerning the ability of social reinforcement to Rorschack productivity appears equivocal. While Boulay (1969) has offered non-supportive evidence, Hersen and Greaves (1971) found significant differences among experimental groups.

Existing evidence apparently does seem to indicate that social reinforcement can be used effectively to modify a wide range of behaviors. In most instances, this effectiveness has been demonstrated despite variations in experimental design and/or setting. Conclusions about the various forms of behavior which have derived supporting

evidence from only one study, or which have been found to be unaffected by social reinforcement, should be reserved pending replication.

DYNAMICS OF THE SOCIAL REINFORCEMENT PROCESS

A large number of studies have examined various dynamic aspects of the social reinforcement process in order to further develop an understanding of its theoretical elements. The major areas of investigation have included: schedules of reinforcement, vicarious reinforcement, i.e., modeling, awareness of the performance/reinforcement contingency; the relationship of social reinforcement to explanatory and motivational theories with particular regard to the function of incentives, and the satiation-deprivation function of social reinforcement.

Reinforcement Schedules

At least three recent studies have led to the general conclusion that partial reinforcement is more effective than continuous reinforcement in the modification of behavior. Crowley (1968) found far greater persistence among subjects working at an insoluble task on partial reinforcement than among subjects working on any of three continuous schedules (praise, blame, or blank). Looking exclusively at the partial reinforcement conditions, subjects receiving praise and blame persisted longer than those receiving praise when paired with blank. Further evidence is offered by Breitmeyer (1969). A study by Yukl, Wexley, and Seymore (1972) found a variable ratio schedule also more efficient than a continuous reinforcement schedule using monetary incentives to increase task performance.

Two additional studies have looked specifically at differences among partial reinforcement schedules. Braun (1970) found that a variable ratio 20% schedule produced more persistence at a task than a variable ratio 80% schedule, regardless of whether subjects were directly or vicariously reinforced. In a comparison of fixed ratio and fixed interval schedules, Rosenbaum (1969) found that subjects persisted at a task longer when they received reinforcement on the interval schedule than on the ratio schedule. Furthermore, there was an interaction between sex of subject and type of schedule used. Boys demonstrated higher rates of response on fixed ratio schedules, while girls performed best on the fixed interval schedules.

Baron, Robinson, and Lawrence (1968) have investigated rates of reinforcement as deviations from experimentally manipulated base-line levels of reinforcement. The examination is guided by a model of social

reinforcement presented by Baron in which he suggests that an individual's social reinforcement history creates an internal standard by which to judge the adequacy of present social reinforcement. (This social reinforcement standard (SRS); i.e., SRS model has also established the basis of investigations conducted by Baron and his associates of the differential effects attributed to race as discussed in a previous section, and will be of further importance in a discussion of the satiation function of social reinforcement to follow later.) Consequently, it was expected that the introduction of uncertainty would cause an individual to alter his behavior in an attempt to identify the response pattern likely to produce a rate of reinforcement that better approximates his SRS. A significant interaction between initial rate of reinforcement and amount of change confirmed this hypothesis.

Vicarious Reinforcement

The effects of vicarious reinforcement have been found, in most instances, to effectively modify observer responses. Berger and Ellsburg (1969) found that subjects who observed a model receive enthusiastic reinforcement in a nonsense syllable task correctly recalled more of those syllables than subjects in the non-enthusiastic condition. Findings also revealed that subjects who received "right" reinforcement recalled more than those who received "wrong" or "nothing" as reinforcement. Similarly, Flanders and Thistlethwaite (1968) report that subjects comprehended and imitated a model's solution of a discrimination task to a greater extent when the model verbalized his choice.

A study conducted by Marlatt (1968) compared the effects of vicarious and direct reinforcement upon problem admission in an interview setting. Results indicated that subjects exposed to a verbal model reported more problems than control subjects. Positive vicarious reinforcement elicited more problems from subjects than positive direct reinforcement. The most effective reinforcement combination was positive vicarious reinforcement when followed by neutral direct reinforcement.

The effects of different reinforcement combinations to a model upon the tendency of an observer to imitate the model have recently been examined by Cheyne (1971). Findings indicated that observation affected both performance and recall of modeled behavior. Observing a model receive positive reinforcement enhanced the subsequent performance of the observer, while receipt of negative reinforcement led to the suppression of the observer's imitative behavior. Recall of the model's verbal behavior, however, increased with both positive and negative reinforcement outcomes. Cheyne attributed a halo effect to positive reinforcement; i.e., negative and neutral modeled items were also repeated more often when the model received at least some positive reinforcement.

A study conducted by Kanfer, Duerfeldt, Martin, and Dorsey (1971) has examined factors that influence an observer's attentiveness and imitation of a model's behavior. They found that children who expected to subsequently perform the modeled behavior attended more to the model than did children who had no such expectation. The performance of subjects exposed to a model was significantly better than those subjects who did not observe a model. The authors concluded that while vicarious reinforcement may not influence attentiveness, it is related to subsequent performance. Attentiveness apparently varies with the expectation of performing the task.

Two studies have recently suggested that competence is an important consideration in determining a model's effect upon an observer. Britt (1971) examined the responses of subjects after observing two models (one competent and one incompetent) who varied in the number of times they agreed with one another. The results of his study demonstrated that subjects in ambiguous, competitive situations tend to imitate models to the extent that they are competitive; i.e., to the extent that they are reinforced for a correct response. Zupnick (1971) presents data which support a similar hypothesis: extinction of a phobic response (fear of handling snakes) would increase as the perceived performance and ability; i.e., competence, of a model increased. Subjects who were exposed to a model regarded as "fearless-competent" demonstrated significantly greater approach and handling behavior than subjects exposed to a "fearful-incompetent" model or control group subjects.

Other available data further support expected modeling effect upon verbal operants (Anderson, 1970), aggressive behavior (Lidman, 1969), sociometric status (Hansen, Niland & Zani, 1969), and classroom behavior (Friedman and Bowers, 1971). In only three studies were effects due to vicarious reinforcement not found significant. Bourdon (1968) demonstrated that a tape-recorded model was unable to alter the verbal response rate of observers. Scoresby (1969) also found that the video presentation of a decision and deliberation model had no effect upon corresponding behavior among observers. It should be noted that both these studies employed a medium of model presentation unlike the majority of studies which have found modeling to be effective. One possible explanation of these findings may be that the video or audio presentation of a model is simply not as strong a manipulation as the live presentation of a model.

The third study (Weiner, 1970) to find non-supportive evidence for modeling actually examined an alternative hypothesis unlike those which have been traditionally proposed. Weiner proposed that the direct reinforcement of one child in a dyad (or two children in a group of four) would "negatively" reinforce the other member(s) of the group. No evidence could be found to support his hypothesis. Consequently, this

finding can not really be considered inconsistent with previous studies which have demonstrated the positive reinforcing value of modeling.

Awareness of Performance-Reward Contingencies

Another factor that has undergone empirical inquiry concerns the role of awareness in the reinforcement process. The majority of studies reviewed have indicated that an awareness of the performance/reward contingency is necessary for subsequent conditioning to occur.

Ault and Vogler (1969) have examined the relationship of various reinforcing cues to awareness of the response-reinforcement contingency. They propose that a subject will be slower in becoming aware of the reinforcement contingency when "blank" is paired with an ambiguous cue, which possibly indicates correct (e.g., "right") than when blank is paired with an unambiguous cue indicating correct (e.g., "correct"). Results demonstrated that conditioning occurred only for those subjects who were both aware of the performance/reinforcement contingency and for whom the appropriate cues were actually reinforcing.

Hamilton, Thompson and White (1970) have indicated the importance of awareness to vicarious reinforcement as well. They report that significant changes in performance were found only among those subjects who were aware of the contingency between an observed model's responses and the administration of reinforcement, and who expressed the intention to imitate the model's behavior.

Although other evidence also exists (Hersen & Greaves, 1971; Fry, Hopkins & Hoge, 1970) to further support the necessity of awareness to conditioning, there have been instances where its necessity has not been demonstrated. A study by Miller and Hood (1970) reports that both aware and unaware subjects conditioned in response to the receipt of reinforcement. Most research, however, does seem to support the previous conclusion.

Motivation Theory and Social Reinforcement

The motivational concepts underlying the social reinforcement paradigm comprise an important set of variables and area of research. The contribution of learning principles (notably knowledge of results) and numerous motivational theories to a further understanding of the reinforcement process have been empirically explored.

Moffat and Motiff (1970) studied the performance of four- and six-year-olds at a discrimination task under three different knowledge of results conditions. It was proposed that when subjects received knowledge of results for right and wrong answers (RW) or for wrong

answers only (Wb, i.e., "wrong" paired with blank) they would perform better than subjects who received knowledge of results for right answers only (Rb). It was believed that the RW and Wb conditions provide an individual with more information than the Rb condition, since blanks are often interpreted as "correct" feedback and, therefore, confusing in the Rb situation. Data confirmed the performance order of the three groups.

In a study by Crowley (1968), the experimenter administered praise, blame or silence to subjects as knowledge of results in the performance of an insoluble task. It was found that subjects receiving praise persisted the longest and those receiving blame remained at the task the shortest period of time.

The relationship of feedback to performance in programmed instruction has been examined by Anderson, Kulhavy, and Andre (1970). It was hypothesized that knowledge of correct responses (KCR) disrupts a student's attention and that presenting answers on the same page as a frame merely produces copying and not learning. Two experiments were conducted to test these predictions. Results indicated that copying and not learning did occur. Furthermore, a mildly frustrating situation was not able to increase attentiveness above that achieved by 100% KCR. Unikel and Strain (1971) examined the qualitative differences arising from the use of social approval ("good") and correctness ("right") feedback on verbal operant conditioning. Both groups were equal to one another and superior to controls during acquisition. In the extinction phase a different experimenter ran half of each group while the same experimenter ran the remaining half. Subjects who had received correct reinforcement revealed no differences in their rate of extinction with either the same or different experimenter. Subjects who had received social approval reinforcement, however, extinguished faster when the different experimenter was present.

A study conducted by Solomon and Yaeger (1969) examined the effects of content and intonation on perceptions of verbal reinforcers. It was found that content significantly affected the perception of a reinforcer's "objective" meaning and only moderately affected the subject's feeling. Intonation, on the other hand, significantly affected the perception of the speaker's liking for the subject. These findings suggest a dual informational and approval function to reinforcement.

Insko and Cialdini (1969) tested predictions based on the hedonistic, informational and two-factor interpretations of attitudinal verbal reinforcement. Examining the role of reinforcers, each approach suggested a different explanation as to their function in verbal conditioning. The rewarding value of "good" according to the hedonistic interpretation, apparently motivates individuals to make correct responses. The informational interpretation proposes that "good" merely informs the subject of the reinforcing agent's point of view which is then followed by a simple conformity effect. According to the

two-factor interpretation, "good" functions in two ways: 1) it offers information as to the agent's attitude, and 2) it offers approval of the subject's response which by implication also approves of the subject himself. Differential predictions concerning the effects of "good" and "huh" as based upon these three interpretations were subsequently examined. Data confirmed the two-factor interpretation.

In a further examination of the two-factor theory, Cialdini and Insko (1969) propose that if both factors are necessary in order for influence to occur in a conditioning situation, the manipulation of only one of the factors (while holding the other constant) should produce a differential effect. The data again confirmed the importance of both factors to attitudinal verbal reinforcement.

A recent article by Buckwald (1969) has argued that the traditional effects attributed to "right" and "wrong" can be explained without using the principle of reinforcement. He posits that this is possible if one assumes that: 1) a subject may recall a response without recalling its outcome (and conversely), 2) a response that is not recalled can only be repeated by chance, and 3) the probability of repeating a response that is recalled is independent of the outcome of that response unless the outcome is also recalled. Two experiments were conducted to test this alternative interpretation to reinforcement. Findings were interpreted as consistent with the theoretical predictions offered. Apparently more research needs to be conducted, however, before any conclusive judgments can be made about the ability of this alternative theory to account for all the effects that have been observed and attributed to reinforcement concepts.

The examination of alternative theoretical frameworks in which to place the observed effects of reinforcement has continued. Sholley (1969) investigated an extension of Festinger's effort justification hypothesis as an alternative explanation for resistance to extinction following a partial reinforcement schedule. It was proposed that when effort is exerted to achieve an insufficient reward, the individual will develop a preference for the behavior because of the effort expended. Two experiments were conducted which yielded results in support of the hypothesis.

Hornbeck (1971) has recently examined the relationship between the magnitude of incentive offered to perform a counterattitudinal act and subsequent attitude change as based upon dissonance theory predictions. Results indicated that subjects who were paid $1.50 evidenced more attitude change as an immediate post-test than those who were paid $.25 to write the counterattitudinal essay.

Other relationships based upon aspects of balance theory have also been explored. A study by Ostrom and Goldstein (1970) focused upon the effects of reinforcement on the perception of the interviewer's attitude.

Results indicated that an interviewer was seen as possessing a relatively pro attitude when he reinforced pro responses and a relatively anti attitude when he reinforced anti responses. This occurred regardless of prior information about the interviewer's attitude; i.e., favorable, unfavorable or no information.

Siegman, Blass and Pope (1970) attempted to use balance theory to explain why interviewers talked more when an interviewer disagreed with them than when he agreed. It was suggested that a liked interviewer who disagrees with a subject will create tension in the subject and, therefore, lead the subject to engage in tension reducing behavior; i.e., talking, in an attempt to restore the original state. Results indicated that mean speech rate of subjects was significantly higher in the unbalanced than balanced condition, but that productivity responses were equivocal.

A study by Cialdini (1970) observed how subjects who reinforced others in their expression of certain attitudinal items were affected themselves by the reinforcement. Findings revealed an advocacy effect in which subjects who reinforced and, thus, advocated a pro position on the issue subsequently became more pro than subjects who reinforced a con position on the issue.

Robinson (1969) has recently examined dissonance theory and incentive theory predictions concerning the effect of positive, negative, or neutral consequences upon attitudinally dissonant, consonant, and irrelevant behavior. Results offered partial support to incentive theory but, generally speaking, did not confirm predictions based on either theory.

Research has also demonstrated the important role played by expectancies in determining the frequency and accuracy of reinforcement as administered by experimenters (Jakubowski, 1968) and in leading to discrepancy reducing strategies among subjects (Fox, 1969). The most sophisticated and dynamic model of social reinforcement to subsume the function of expectancies and to propose a theoretical framework based upon fundamental "balance" principles is that offered by Baron (1970). The social reinforcement standard (SRS) model (which has been previously discussed in various contexts) was used by Baron to examine Negro responsiveness to social reinforcement. Results from a series of studies offered general support to the model and the proposition that, at least in certain circumstances, Negroes would find a low rate of approval from a white authority figure more appropriate than a high rate of approval. More recent examinations of the model by Baron and his associates (Baron, Heckenmueller & Schultz, 1971; Baron, Jackson & Fish, 1972) have demonstrated the complex relationship of race, source of reinforcement, reinforcement standard, type of reinforcer, and situation in determining receptivity to social reinforcement.

Other theories and models of motivation have also contributed to an understanding of contingency reinforcement. Instrumentality theories (cf. Broom, 1964; Lawler, 1971) have been particularly important in this regard. The basic distinguishing element of instrumentality theory is the belief that cognitions mediate behavior. Furthermore, behavior is interpreted as a consequence of its instrumentality in obtaining rewards and the attractiveness (valence) of those rewards. Available research has supported elements of this model and the general proposition that individuals will behave in ways which they expect will lead to valued rewards (Graen, 1969; Galbraith & Cummings, 1967; Schneider & Olsen, 1970; Cherrington, Reitz, & Scott, 1971; Arvey & Dunnette, 1970; Deci, 1971). In a recent review of instrumentality theory research, Mitchell and Biglan (1971) conclude that instrumentality theory has been less successful in predicting behavior and satisfaction in organizations than in explaining attitude and verbal conditioning. They attribute the differences in success to the complexity of real life phenomena (as evident in organizations) which usually does not pervade the settings in which attitude and verbal conditioning are studied.

Equity theory constitutes another motivational framework in which to interpret the meaning of rewards. Theoretically, an individual compares his ratio of job inputs (any investment in a job) and job outcomes (returns on the investment) to the same ratio of some other individual within the work setting. To the extent that the ratios are unequal, the individual is motivated to reduce the discrepancy. Research examining these dynamics (cf., Pritchard, 1969; Pritchard, Jorgenson & Dunnette, 1972) has offered general support to the theory. Such an approach has implications for systemic behavior observations and multiple social reinforcements in a group or classroom setting, as selective (individual) reinforcement could potentially generate inequity.

The relative value of reviewing research which has examined instrumentality and equity theories has been to establish an additional motivational basis for incentives. The functional utility of incentives within the context of either incentive theory or other motivation theories has led numerous authors (e.g., Nord, 1969; Jablonsky & DeVries, 1972; Forness, 1970; Lehrer, Schiff & Kris, 1970) to propose its practical application.

Motivational Properties of Incentives

Research has also focused specifically upon various motivational aspects of incentives themselves. Incentive magnitude, incentive contrast, and stability of incentive values illustrate the properties which have been investigated. Although all of these studies do not deal exclusively with social incentives, they are of importance in identifying critical process variables common to both social and non-social incentives.

A study by Weinstein and Colucci (1970) compared the responses made by subjects who were offered different amounts of incentives in the performance of arithmetic problems. An inverse relationship was found between size of incentive and latency of response. Subjects who received the largest incentive took the shortest amount of time to respond.

Blank and Monge (1970) have recently examined absolute and relative interpretations of incentive magnitude effects. They hypothesized that a performance difference favoring the high incentive ($3.00) group would occur only when subjects knew the size of the alternative incentive ($.25); i.e., in the relative condition. No differences were found among experimental treatments. A study by Humphries and Stabler (1969) was also unable to demonstrate any differences in the probability learning of children due to level of incentives (marbles later traded for a small toy or feedback of correct responses).

Frase (1971) was able to demonstrate how incentives could be used to facilitate text learning among undergraduates. He had hypothesized that incentives will lead to greater recall when subjects are informed of the incentives before reading a passage than when they are informed of the incentives after reading the passage. Results confirmed the expectations.

Effects due to incentive contrast have been investigated in at least two studies. Baldwin (1968) was unable to demonstrate any contrast effects by varying the availability of rewards in two situations. A study by Weinstein (1970), however, found significant effects due to both positive and negative incentive contrasts. In the first of two experiments examining these effects, Weinstein found a positive relationship between latency of response and size of reward decrement. Similarly, in a second experiment, he demonstrated that positive incentive contrast effects were a monotonic function of reinforcement increments.

Other research has examined possible factors that may influence the value attributed to an incentive. Knott (1967) found that subjects, who were frustrated in their attempts to acquire available monetary incentives, looked at pictures of money more often, overestimated the amount of money to a greater extent, and attributed more positive statements to a neutral stimulus associated with the rewards than control subjects. It was concluded that frustration produces a temporary, immediate increase in the incentive value of a reward.

A further examination of incentive value stability has been conducted by Shealy (1969). He studied changes in color preferences as a function of pairing with other colors of various preference values and amount of pairing. Results indicated that color preferences were stable and not significantly affected by either the pairing of incentives or amount of pairing. Other research (cf. Nealey, 1964; Nealey & Goodale,

1967; Haaf, Feldstein, & Witryol, 1970; Haaf, 1971) suggests that the value of an incentive may be a function of the situation in which it is offered and the variety of other incentives also available.

Incentives have also been studied as determinants of individual goals and intentions. Locke, Bryan and Kendall (1968) have presented evidence to demonstrate that incentives; e.g., money, affect performance only to the extent that they affect an individual's goals and intentions. Further support for the relationship between goals and performance is offered by Cummings, Schwab and Rosen (1971).

The apparent emphasis upon monetary incentives in the examination of their motivational properties has recently been criticized by Schrieber and Sloan (1970). Claiming that financial incentives are based upon an outmoded economic model of man, they argue in defense of a broadened concept of incentives to include a variety of psychological (e.g., social) incentives. They contend that this integration of available incentives is consistent with contemporary theories of human motivation which emphasize the importance of psychological needs. Research examining social systems of reinforcement as evident in the current review would appear to support the argument posited by Schrieber and Sloan.

Satiation of Social Approval

An important process dynamic concerns the satiation function of social approval. Generally speaking, the deprivation-satiation effect is characterized by an inverse relationship between the frequency of social reinforcement received during a preceding period of time and its subsequent effectiveness as a reinforcer. The following eight studies present our current understanding of this relationship.

A study by Cook (1968) examined the verbal satiation process in children. He found that the continued repetition of a positive or negative verbal reinforcer did decrease its effectiveness as a reinforcer. Furthermore, it was found that the effectiveness of a reinforcer was altered regardless of whether the previously repeated word was positive or negative. Apparently, the satiation effect was not dependent upon the semantic characteristics (positive or negative) of the word. In a later study, Cook (1970) has offered additional evidence to support the satiation effect by demonstrating that the effectiveness of "good" as a reinforcer decreased as the duration of its continuous repetition increased.

Gilley (1969) examined the effect of vicarious reinforcement upon the satiation of social approval. Results indicated that subjects who had observed a model being reinforced and who had been reinforced themselves demonstrated significantly better performance than control

subjects. Satiation apparently did not occur through the mechanism of vicarious reinforcement.

In order to test the proposition that social incentives are more effective with people who have been historically deprived of them, Goyen and Lyle (1971) compared the responses of retarded and normal readers to a learning task under the assumption that the latter have traditionally received more social reinforcement than the former. No significant differences were found between the groups on task performance or rate of learning. The tenuous nature of the original assumption may be more responsible for these findings than the possible conclusion that prior deprivation is unrelated to the subsequent effectiveness of social reinforcers.

Babad (1971) has offered a cognitive interpretation of the social deprivation-satiation effects. He posits that the critical process is learning the reinforcing value of the particular source of the reinforcing stimuli. This stresses the role of information as derived from deprivation and satiation experiences. Furthermore, it focuses on the subject's perception of the contingencies of the interaction between himself and the reinforcing agent. Babad tested two hypotheses: 1) that the social deprivation-satiation effect (SDSE) is a person-specific effect, not readily generalizable to other reinforcing agents, and 2) that the SDSE pattern can be created by providing the subjects with appropriate information input without subjecting them to actual deprivation or satiation treatments. Both hypotheses were confirmed with middle class children, but not with lower class children. Babad concluded that the failure of lower class children to cognize as hypothesized was due to the combination of long-term social deprivation, an unstable environment which encourages reaction to the immediate and concrete, and the arousing nature of the experimental situation.

In a review of research examining the deprivation-satiation function of social approval, Eisenberger (1970) comments that while a large number of studies have successfully replicated the deprivation-satiation effect using choice measures of instrumental performance, other studies using rate or duration measures have produced weak and inconsistent findings. Eisenberger suggests that the methodological deficiencies of the latter studies make the interpretation of their results highly equivocal. Furthermore, the currently available body of research suggests that changes in approval-contingent performance resulting from the deprivation and satiation of social reinforcement cannot be attributed to changes in general sensory deprivation, general drive level, or cue properties of approval comments. Eisenberger concludes that the withholding and presentation of approval alters the motivation for obtaining it.

The recent work of Baron and his associates (Baron, Heckenmueller & Shultz, 1971; Baron, Jackson & Fish, 1972) has examined the long- and short-term determinants of social reinforcer effectiveness. Studied

within the context of race differences, their research suggests a complex interaction of reinforcement history (attributable to race) and availability of praise in explaining the efficacy of social reinforcement. They have proposed that short term variations in the availability of a social stimulus depend upon the experimenter's ability to elicit an above-threshold level of attention from subjects. Data suggest that a black experimenter is better able than a white experimenter to accomplish this function. The introduction of a black reinforcing agent in an unfamiliar setting apparently constitutes a sufficiently unique situation so as to arouse level of attention. These findings (as discussed in earlier sections of this report) thus introduce an additional set of variables to be considered in further investigations of the deprivation-satiation function of social approval.

CONCLUSIONS

1. Previous research on social reinforcement has primarily utilized verbal praise as the reinforcer. Additional reinforcers studied under the rubric of social incentive systems have modified some behaviors, but do not yield generalized dimensions for the delineation of a social reinforcement concept. As a preliminary definition, we consider a reinforcing stimulus to be social if its reward value is related to another individual or group interacting with the reinforced subject.

2. Results on behavior-change effects of social reinforcers are highly equivocal. Comparisons of social and nonsocial reinforcement effects have shown divergent results across studies. The superiority of a particular class of reinforcers depends on the behavioral criterion (e.g., performance speed, accuracy, or persistence), the nature of the task (e.g., concept formation, learning tasks, intelligence testing, imitative responses), and individual differences in age, sex, and socioeconomic status. Some evidence favors the combination of social and nonsocial reinforcers in an operant behavior-change system.

3. Characteristics of the subject affect his responsiveness to social reinforcement.

   (a) Significant social reinforcement effects have been found in clinically deviant populations. However, in the few research paradigms offering comparisons to "normal" subjects, no differential effects were found.

   (b) Contrary to expectation, subjects low in perceived similarity to parents are more responsive to social

reinforcement than parental-similar subjects. This effect may be due, however, to the novelty of social reinforcement, if in fact it is less prevalent in the home of low-similarity subjects.

(c) No conclusions can be reasonably drawn at this time concerning socioeconomic status as a moderating variable. In examinations of social reinforcement effects on lower- and middle-class children, 3 studies showed no differential effects, 3 studies reported greater response to social reinforcement in the middle-class group, and 1 study showed that middle-class subjects also responded at a higher level to tangible incentives.

(d) Though evidence is meager, older persons seem to respond more to social reinforcement than do younger people. Studies documenting age relationships have, however, been restricted to samples of children and elderly adults.

(e) Effects of sex and race appear dependent on subject-reinforcing agent interactions. Even then whether homogeneous or heterogeneous pairs facilitate social reinforcement is situationally relative. At least one study reports greater effects with same-sex pairs. With regard to the reinforcing agent, social reinforcement effects tend to diminish when the agent is changed. Additionally, one's social peers tend to be effective reinforcing agents.

(f) Attempts to relate social reinforcement effects to personality differences have generated little knowledge. The only variable demonstrating a fairly direct effect is that of affective state, where depressed states inhibit social reinforcement effectiveness. This variable, of course, may also be situationally, as well as personally, determined. Theorists have suggested other possible relations to social motivation and locus of control.

4. A variety of behaviors have been found amenable to change with social reinforcement. These behaviors include various forms of verbal behavior, attitudes, clinical phobias, group participation, cohesiveness, and leadership behaviors, and, though less clearly, classroom behaviors. An interesting finding from the classroom research showed the effectiveness of making individual reinforcement contingent upon group performance. Of further interest to our particular research are findings that social reinforcement increased: (a) altrusitic behavior, and (b) basic combat training performance in the Army.

5. Several dynamics of the reinforcement process play an important role in determining its effectiveness. Partial reinforcement has been found more effective than continuous reinforcement for both social and nonsocial incentives; results are mixed, however, concerning the relative efficacy of specific partial reinforcement schedules. Vicarious social reinforcement also affects behavior, although effects vary with characteristics of the model. Motivation theory and research also suggests that reinforcement effects require awareness of behavior-reward contingencies, the availability of positively valued rewards, and feedback. The reinforcement value of feedback appears to depend on its dual functions of providing information (knowledge of results) and social approval. Understanding the process dynamics of social reinforcement has been furthered by concepts from cognitive consistency and expectancy theories of human motivation. Motivational aspects of incentives that may be responsible for their effects include their magnitude, contrast, stability, and mediating effects on goals and intentions.

6. The effectiveness of social reinforcement may be related to previous deprivation. However, the deprivation-satiation function has also been found to depend on whether reinforcement is direct or vicarious, differential reinforcement histories (and environments) across races and social classes, and general attention level of the subject.

7. Generally speaking, then, while social reinforcement offers a potential path to behavior modification, its predicted effects are presently intertwined with a vast number of "moderating variables." Situational constraints derive from a complex interaction of subject and reinforcing agent characteristics, behaviors being reinforced, and the dynamics of the reinforcement process. In reviewing research in this area, two basic problem areas may be noted. First, considerations of methodological rigor in specific studies have prevented us from drawing firm conclusions about particular relationships and effects. Second, and more importantly, the literature lacks a sound theoretical base for predicting effects of social reinforcement, directing research, and integrating its results into a comprehensive body of scientific knowledge from which practical applications can be successfully derived. Future research should systematically investigate determinants of the value of social incentives and the processes through which they can be applied to changing human behavior in social and learning settings.

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